

SEQUENCE LISTING

<110> Wisconsin Alumni Research Foundation et al.
Pioneer Hi-Bred, International Inc.
Regents of The University of Minnesota
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Springer, Nathan M.
Muszynski, Michael G.
Papa, Charles M.

<120> Nucleic Acid and Amino Acid Sequences Encoding Class II
DNA Methyltransferases

<130> WIS4987P0051PCT

<140> PCT/US00/06456

<141> 2000-03-10

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<170> PatentIn Ver. 2.1

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210> 4

211> 922

212> PRT

213> Zea mays

400> 4

Arg Ala Ala Ala Ala Thr Ala Ala Pro Ala Met Ala Pro Ser Ser Pro
1 5 10 15

Ser Pro Ala Ala Pro Thr Arg Val Ser Gly Arg Lys Arg Ala Ala Lys
20 25 30

Ala Glu Glu Ile His Gln Asn Lys Glu Glu Glu Glu Val Ala Ala
35 40 45

Ala Ser Ser Ala Lys Arg Ser Arg Lys Ala Ala Ser Ser Gly Lys Lys
50 55 60

Pro Lys Ser Pro Pro Lys Gln Ala Lys Pro Gly Arg Lys Lys Lys Gly
65 70 75 80

Asp Ala Glu Met Lys Glu Pro Val Glu Asp Asp Val Cys Ala Glu Glu
85 90 95

Pro Asp Glu Glu Glu Leu Ala Met Gly Glu Glu Glu Ala Glu Glu Gln
 100 105 110
 Ala Met Gln Glu Glu Val Val Ala Val Ala Ala Gly Ser Pro Gly Lys
 115 120 125
 Lys Arg Val Gly Arg Arg Asn Ala Ala Ala Ala Gly Asp His Glu
 130 135 140
 Pro Glu Phe Ile Gly Ser Pro Val Ala Ala Asp Glu Ala Arg Ser Asn
 145 150 155 160
 Trp Pro Lys Arg Tyr Gly Arg Ser Thr Ala Ala Lys Lys Pro Asp Glu
 165 170 175
 Glu Glu Glu Leu Lys Ala Arg Cys His Tyr Arg Ser Ala Lys Val Asp
 180 185 190
 Asn Val Val Tyr Cys Leu Gly Asp Asp Val Tyr Val Lys Ala Gly Glu
 195 200 205
 Asn Glu Ala Asp Tyr Ile Gly Arg Ile Thr Glu Phe Phe Glu Gly Thr
 210 215 220
 Asp Gln Cys His Tyr Phe Thr Cys Arg Trp Phe Phe Arg Ala Glu Asp
 225 230 235 240
 Thr Val Ile Asn Ser Leu Val Ser Ile Ser Val Asp Gly His Lys His
 245 250 255
 Asp Pro Arg Arg Val Phe Leu Ser Glu Glu Lys Asn Asp Asn Val Leu
 260 265 270
 Asp Cys Ile Ile Ser Lys Val Lys Ile Val His Val Asp Pro Asn Met
 275 280 285
 Asp Pro Lys Ala Lys Ala Gln Leu Ile Glu Ser Cys Asp Leu Tyr Tyr
 290 295 300
 Asp Met Ser Tyr Ser Val Ala Tyr Ser Thr Phe Ala Asn Ile Ser Ser
 305 310 315 320
 Glu Asn Gly Gln Ser Gly Ser Asp Thr Ala Ser Gly Ile Ser Ser Asp
 325 330 335
 Asp Val Asp Leu Glu Thr Ser Ser Ser Met Pro Thr Arg Thr Ala Thr
 340 345 350

Leu Leu Asp Leu Tyr Ser Gly Cys Gly Gly Met Ser Thr Gly Leu Cys
 355 360 365
 Leu Gly Ala Ala Leu Ser Gly Leu Lys Leu Glu Thr Arg Trp Ala Val
 370 375 380
 Asp Phe Asn Ser Phe Ala Cys Gln Ser Leu Lys Tyr Asn His Pro Gln
 385 390 395 400
 Thr Glu Val Arg Asn Glu Lys Ala Asp Glu Phe Leu Ala Leu Leu Lys
 405 410 415
 Glu Trp Ala Val Leu Cys Lys Lys Tyr Val Gln Asp Val Asp Ser Asn
 420 425 430
 Leu Ala Ser Ser Glu Asp Gln Ala Asp Glu Asp Ser Pro Leu Asp Lys
 435 440 445
 Asp Glu Phe Val Val Glu Lys Leu Val Gly Ile Cys Tyr Gly Gly Ser
 450 455 460
 Asp Arg Glu Asn Gly Ile Tyr Phe Lys Val Gln Trp Glu Gly Tyr Gly
 465 470 475 480
 Pro Glu Glu Asp Thr Trp Glu Pro Ile Asp Asn Leu Ser Asp Cys Pro
 485 490 495
 Gln Lys Ile Arg Glu Phe Val Gln Glu Gly His Lys Arg Lys Ile Leu
 500 505 510
 Pro Leu Pro Gly Asp Val Asp Val Ile Cys Gly Gly Pro Pro Cys Gln
 515 520 525
 Gly Ile Ser Gly Phe Asn Arg Tyr Arg Asn Arg Asp Glu Pro Leu Lys
 530 535 540
 Asp Glu Lys Asn Lys Gln Met Val Thr Phe Met Asp Ile Val Ala Tyr
 545 550 555 560
 Leu Lys Pro Lys Tyr Val Leu Met Glu Asn Val Val Asp Ile Leu Lys
 565 570 575
 Phe Ala Asp Gly Tyr Leu Gly Lys Tyr Ala Leu Ser Cys Leu Val Ala
 580 585 590
 Met Lys Tyr Gln Ala Arg Leu Gly Met Met Val Ala Gly Cys Tyr Gly
 595 600 605

Leu Pro Gln Phe Arg Met Arg Val Phe Leu Trp Gly Ala Leu Ser Ser
 610 615 620
 Met Val Leu Pro Lys Tyr Pro Leu Pro Thr Tyr Asp Val Val Val Arg
 625 630 635 640
 Gly Gly Ala Pro Asn Ala Phe Ser Gln Cys Met Val Ala Tyr Asp Glu
 645 650 655
 Thr Gln Lys Pro Ser Leu Lys Lys Ala Leu Leu Leu Gly Asp Ala Ile
 660 665 670
 Ser Asp Leu Pro Lys Val Gln Asn His Gln Pro Asn Asp Val Met Glu
 675 680 685
 Tyr Gly Gly Ser Pro Lys Thr Glu Phe Gln Arg Tyr Ile Arg Leu Ser
 690 695 700
 Arg Lys Asp Met Leu Asp Trp Ser Phe Gly Glu Gly Ala Gly Pro Asp
 705 710 715 720
 Glu Gly Lys Leu Leu Asp His Gln Pro Leu Arg Leu Asn Asn Asp Asp
 725 730 735
 Tyr Glu Arg Val Gln Gln Ile Pro Val Lys Lys Gly Ala Asn Phe Arg
 740 745 750
 Asp Leu Lys Gly Val Arg Val Gly Ala Asn Asn Ile Val Glu Trp Asp
 755 760 765
 Pro Glu Ile Glu Arg Val Lys Leu Ser Ser Gly Lys Pro Leu Val Pro
 770 775 780
 Asp Tyr Ala Met Ser Phe Ile Lys Gly Lys Ser Leu Lys Pro Phe Gly
 785 790 795 800
 Arg Leu Trp Trp Asp Glu Thr Val Pro Thr Val Val Thr Arg Ala Glu
 805 810 815
 Pro His Asn Gln Val Ile Ile His Pro Thr Gln Ala Arg Val Leu Thr
 820 825 830
 Ile Arg Glu Asn Ala Arg Leu Gln Gly Phe Pro Asp Tyr Tyr Arg Leu
 835 840 845
 Phe Gly Pro Ile Lys Glu Lys Tyr Ile Gln Val Gly Asn Ala Val Ala
 850 855 860

Val Pro Val Ala Arg Ala Leu Gly Tyr Cys Leu Gly Gln Ala Tyr Leu
 865 870 875 880

Gly Glu Ser Glu Gly Ser Asp Pro Leu Tyr Gln Leu Pro Pro Ser Phe
 885 890 895

Thr Ser Val Gly Gly Arg Thr Ala Gly Gln Ala Arg Ala Ser Pro Val
 900 905 910

Gly Thr Pro Ala Gly Glu Val Val Glu Gln
 915 920

<210> 5
 <211> 9
 <212> PRT
 <213> Zea mays

<210> 5
 <211> 9
 <212> PRT
 <213> Zea mays

<210> 6
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <221> Description of Artificial Sequence: This sequence
 was artificially synthesized based on the sequence
 of Zea mays.

<400> 6
 tggttgctat ggtctgccac agttcag

27

<210> 7
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
 <221> Description of Artificial Sequence: This sequence
 was artificially synthesized based on the sequence
 of Zea mays.

<400> 7

ccagctcagc tcagatctgt catccttt

28

<210> 8

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 8

cgaaagctaa tctacacaaa cagc

24

<210> 9

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 9

catcctctga gcttgctaaa tttg

24

<210> 10

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 10

ctcatcttgg agtggtcat cac

23

<210> 11

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence was artificially synthesized based on the sequence of Zea mays.

<400> 11

gagcacatga gggagagtgt tg

22

<210> 12

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence was artificially synthesized based on the sequence of Zea mays.

<400> 12

ttctctaattt tctgctgggca g

21

<210> 13

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence was artificially synthesized based on the sequence of Zea mays.

<400> 13

cctctgccca cctatgatgt tgta

24

<210> 14

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence was artificially synthesized based on the sequence of Zea mays.

<400> 14
taaagggcgt gaggggttga

20

<210> 15
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 15
tcacatttgt catggcaggt tatc

24

<210> 16
<211> 24
<212> DNA
<213> Artificial Sequence
<220>

<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 16
atgaggaaaa gaacgacaat gtgc

24

<210> 17
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 17
gcaatcaagc acattgtcgt tcttttcttc

30

<210> 18

<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 18
gaagaagagg gtggggagaa ggaacg

26

<210> 19
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 19
ttccttgagg cagtgcgcg

20

<210> 20
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 20
gtattgaatt gattctaac tagtgcac

28

<210> 21
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: This sequence

was artificially synthesized based on the sequence
of Zea mays.

<400> 21

caggctcaac ggcgatg

17

<210> 22

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 22

gatgcttcac cacatagacc caagtc

26

<210> 23

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 23

gatagaccta atgccaaatg agattaag

28

<210> 24

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 24

gcgatcttca gtctccacca tc

22

<210> 25
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 25
gaagacgtgc ctccatgttt catc

24

<210> 26
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 26
gttggttctt ccgagcagag g

21

<210> 27
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 27
gactgccaca tatcttatta atcgc

25

<210> 28
<211> 26
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence was artificially synthesized based on the sequence of Zea mays.

<400> 28

gcatgtgtca gcaattgctt acattc

26

<210> 29

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence was artificially synthesized based on the sequence of Zea mays.

<400> 29

ctcttgctcg gaagaaccaa c

21

<210> 30

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence was artificially synthesized based on the sequence of Zea mays.

<400> 30

ctgttcggag attcatgcat gatg

24

<210> 31

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence was artificially synthesized based on the sequence of Zea mays.

<400> 31

ggagaacaga atggttgatt caatgg

26

<210> 32

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 32

gcacttcact ctcttgcaa acc

23

<210> 33

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 33

cggtacgctg ctgctgctct c

21

<210> 34

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 34

ccatagcatc tcacatctg caagg

25

<210> 35

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence was artificially synthesized based on the sequence of Zea mays.

<400> 35

ggaaagaagg cagttagttg taaatggg

28

<210> 36

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence was artificially synthesized based on the sequence of Zea mays.

<400> 36

gagaagcca acgccawcgc ctcyatttcg tc

32

<210> 37

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence was artificially synthesized based on the sequence of Zea mays.

<400> 37

ctacaacatc atagttgggc agagg

25

<210> 38

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence was artificially synthesized based on the sequence of Zea mays.

<400> 38
actcactata gggctcgagc ggc

23

<210> 39
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 39
taatacgact cactataggg

20

<210> 40
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 40
gatttaggtg acactatag

19

<210> 41
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: This sequence
was artificially synthesized based on the sequence
of Zea mays.

<400> 41
gtttcccg tcacgac

17

<210> 42

<211> 17
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: This sequence was artificially synthesized based on the sequence of *Zea mays*.

<400> 42
 caggaaacag ctatgac

17

<210> 43
 <211> 912
 <212> PRT
 <213> *Zea mays*

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<400> 43
Met Ala Pro Ser Ser Pro Ser Pro Ala Ala Pro Thr Arg Val Ser Gly
1           5           10           15
Arg Lys Arg Ala Ala Lys Ala Glu Glu Ile His Gln Asn Lys Glu Glu
20           25           30
Glu Glu Glu Val Ala Ala Ala Ser Ser Ala Lys Arg Ser Arg Lys Ala
35           40           45
Ala Ser Ser Gly Lys Lys Pro Lys Ser Pro Pro Lys Gln Ala Lys Pro
50           55           60
Gly Arg Lys Lys Lys Gly Asp Ala Glu Met Lys Glu Pro Val Glu Asp
65           70           75           80
Asp Val Cys Ala Glu Glu Pro Asp Glu Glu Glu Leu Ala Met Gly Glu
85           90           95
Glu Glu Ala Glu Glu Gln Ala Met Gln Glu Glu Val Val Ala Val Ala
100          105          110
Ala Gly Ser Pro Gly Lys Lys Arg Val Gly Arg Arg Asn Ala Ala Ala
115          120          125
Ala Ala Gly Asp His Glu Pro Glu Phe Ile Gly Ser Pro Val Ala Ala
130          135          140
Asp Glu Ala Arg Ser Asn Trp Pro Lys Arg Tyr Gly Arg Ser Thr Ala
145          150          155          160

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Ala Lys Lys Pro Asp Glu Glu Glu Glu Leu Lys Ala Arg Cys His Tyr
165 170 175

Arg Ser Ala Lys Val Asp Asn Val Val Tyr Cys Leu Gly Asp Asp Val
180 185 190

Tyr Tyr Lys Ala Gly Glu Asn Glu Ala Asp Tyr Ile Gly Arg Ile Thr
195 200 205

Glu Phe Phe Glu Gly Thr Asp Gln Cys His Tyr Phe Thr Cys Arg Trp
210 215 220

Phe Phe Arg Ala Glu Asp Thr Val Ile Asn Ser Leu Val Ser Ile Ser
225 230 235 240

Val Asp Gly His Lys His Asp Pro Arg Arg Val Phe Leu Ser Glu Glu
245 250 255

Lys Asn Asp Asn Val Leu Asp Cys Ile Ile Ser Lys Val Lys Ile Val
260 265 270

His Val Asp Pro Asn Met Asp Pro Lys Ala Lys Ala Gln Leu Ile Glu
275 280 285

Ser Cys Asp Leu Tyr Tyr Asp Met Ser Tyr Ser Val Ala Tyr Ser Thr
290 295 300

Phe Ala Asn Ile Ser Ser Glu Asn Gly Gln Ser Gly Ser Asp Thr Ala
305 310 315 320

Ser Gly Ile Ser Ser Asp Asp Val Asp Leu Glu Thr Ser Ser Ser Met
325 330 335

Pro Thr Arg Thr Ala Thr Leu Leu Asp Leu Tyr Ser Gly Cys Gly Gly
340 345 350

Met Ser Thr Gly Leu Cys Leu Gly Ala Ala Leu Ser Gly Leu Lys Leu
355 360 365

Glu Thr Arg Trp Ala Val Asp Phe Asn Ser Phe Ala Cys Gln Ser Leu
370 375 380

Lys Tyr Asn His Pro Gln Thr Glu Val Arg Asn Glu Lys Ala Asp Glu
385 390 395 400

Phe Leu Ala Leu Leu Lys Glu Trp Ala Val Leu Cys Lys Lys Tyr Val
405 410 415

Gln Asp Val Asp Ser Asn Leu Ala Ser Ser Glu Asp Gln Ala Asp Glu
 420 425 430
 Asp Ser Pro Leu Asp Lys Asp Glu Phe Val Val Glu Lys Leu Val Gly
 435 440 445
 Ile Cys Tyr Gly Gly Ser Asp Arg Glu Asn Gly Ile Tyr Phe Lys Val
 450 455 460
 Gln Trp Glu Gly Tyr Gly Pro Glu Glu Asp Thr Trp Glu Pro Ile Asp
 465 470 475 480
 Asn Leu Ser Asp Cys Pro Gln Lys Ile Arg Glu Phe Val Gln Glu Gly
 485 490 495
 His Lys Arg Lys Ile Leu Pro Leu Pro Gly Asp Val Asp Val Ile Cys
 500 505 510
 Gly Gly Pro Pro Cys Gln Gly Ile Ser Gly Phe Asn Arg Tyr Arg Asn
 515 520 525
 Arg Asp Glu Pro Leu Lys Asp Glu Lys Asn Lys Gln Met Val Thr Phe
 530 535 540
 Met Asp Ile Val Ala Tyr Leu Lys Pro Lys Tyr Val Leu Met Glu Asn
 545 550 555 560
 Val Val Asp Ile Leu Lys Phe Ala Asp Gly Tyr Leu Gly Lys Tyr Ala
 565 570 575
 Leu Ser Cys Leu Val Ala Met Lys Tyr Gln Ala Arg Leu Gly Met Met
 580 585 590
 Val Ala Gly Cys Tyr Gly Leu Pro Gln Phe Arg Met Arg Val Phe Leu
 595 600 605
 Trp Gly Ala Leu Ser Ser Met Val Leu Pro Lys Tyr Pro Leu Pro Thr
 610 615 620
 Tyr Asp Val Val Val Arg Gly Gly Ala Pro Asn Ala Phe Ser Gln Cys
 625 630 635 640
 Met Val Ala Tyr Asp Glu Thr Gln Lys Pro Ser Leu Lys Lys Ala Leu
 645 650 655
 Leu Leu Gly Asp Ala Ile Ser Asp Leu Pro Lys Val Gln Asn His Gln
 660 665 670

Pro Asn Asp Val Met Glu Tyr Gly Gly Ser Pro Lys Thr Glu Phe Gln
675 680 685

Arg Tyr Ile Arg Leu Ser Arg Lys Asp Met Leu Asp Trp Ser Phe Gly
690 695 700

Glu Gly Ala Gly Pro Asp Glu Gly Lys Leu Leu Asp His Gln Pro Leu
705 710 715 720

Arg Leu Asn Asn Asp Asp Tyr Glu Arg Val Gln Gln Ile Pro Val Lys
725 730 735

Lys Gly Ala Asn Phe Arg Asp Leu Lys Gly Val Arg Val Gly Ala Asn
740 745 750

Asn Ile Val Glu Trp Asp Pro Glu Ile Glu Arg Val Lys Leu Ser Ser
755 760 765

Gly Lys Pro Leu Val Pro Asp Tyr Ala Met Ser Phe Ile Lys Gly Lys
770 775 780

Ser Leu Lys Pro Phe Gly Arg Leu Trp Trp Asp Glu Thr Val Pro Thr
785 790 795 800

Val Val Thr Arg Ala Glu Pro His Asn Gln Val Ile Ile His Pro Thr
805 810 815

Gln Ala Arg Val Leu Thr Leu Arg Glu Asn Ala Arg Leu Gln Gly Phe
820 825 830

Pro Asp Tyr Tyr Arg Leu Phe Gly Pro Ile Lys Glu Lys Tyr Ile Gln
835 840 845

Val Gly Asn Ala Val Ala Val Pro Val Ala Arg Ala Leu Gly Tyr Cys
850 855 860

Leu Gly Gln Ala Tyr Leu Gly Glu Ser Glu Gly Ser Asp Pro Leu Tyr
865 870 875 880

Gln Leu Pro Pro Ser Phe Thr Ser Val Gly Gly Arg Thr Ala Gly Gln
885 890 895

Ala Arg Ala Ser Pro Val Gly Thr Pro Ala Gly Glu Val Val Glu Gln
900 905 910

<210> 44
 <211> 791
 <212> PRT
 <213> Arabidopsis thaliana

<400> 44
 Met Ala Ala Arg Asn Lys Gln Lys Lys Arg Ala Glu Pro Glu Ser Asp
 1 5 10 15

Leu Cys Phe Ala Gly Lys Pro Met Ser Val Val Glu Ser Thr Ile Arg
 20 25 30

Trp Pro His Arg Tyr Gln Ser Lys Lys Thr Lys Leu Gln Ala Pro Thr
 35 40 45

Lys Lys Pro Ala Asn Lys Gly Gly Lys Lys Glu Asp Glu Glu Ile Ile
 50 55 60

Lys Gln Ala Lys Cys His Phe Asp Lys Ala Leu Val Asp Gly Val Leu
 65 70 75 80

Ile Asn Leu Asn Asp Asp Val Tyr Val Thr Gly Leu Pro Gly Lys Leu
 85 90 95

Lys Phe Ile Ala Lys Val Ile Glu Leu Phe Glu Ala Asp Asp Gly Val
 100 105 110

Pro Tyr Cys Arg Phe Arg Trp Tyr Tyr Arg Pro Glu Asp Thr Leu Ile
 115 120 125

Glu Arg Phe Ser His Leu Val Gln Pro Lys Arg Val Phe Leu Ser Asn
 130 135 140

Asp Glu Asn Asp Asn Pro Leu Thr Cys Ile Trp Ser Lys Val Asn Ile
 145 150 155 160

Ala Lys Val Pro Leu Pro Lys Ile Thr Ser Arg Ile Glu Gln Arg Val
 165 170 175

Ile Pro Pro Cys Asp Tyr Tyr Tyr Asp Met Lys Tyr Glu Val Pro Tyr
 180 185 190

Leu Asn Phe Thr Ser Ala Asp Asp Gly Ser Asp Ala Ser Ser Ser Leu
 195 200 205

Ser Ser Asp Ser Ala Leu Asn Cys Phe Glu Asn Leu His Lys Asp Glu

210	215	220
Lys Phe Leu Leu Asp Leu Tyr Ser Gly Cys Gly Ala Met Ser Thr Gly		
225	230	235 240
Phe Cys Met Gly Ala Ser Ile Ser Gly Val Lys Leu Ile Thr Lys Trp		
245	250	255
Ser Val Asp Ile Asn Lys Phe Ala Cys Asp Ser Leu Lys Leu Asn His		
260	265	270
Pro Glu Thr Glu Val Arg Asn Glu Ala Ala Glu Asp Phe Leu Ala Leu		
275	280	285
Leu Lys Glu Trp Lys Arg Leu Cys Glu Lys Phe Ser Leu Val Ser Ser		
290	295	300
Thr Glu Pro Val Glu Ser Ile Ser Glu Leu Glu Asp Glu Glu Val Glu		
305	310	315 320
Glu Asn Asp Asp Ile Asp Glu Ala Ser Thr Gly Ala Glu Leu Glu Pro		
325	330	335
Gly Glu Phe Glu Val Glu Lys Phe Leu Gly Ile Met Phe Gly Asp Pro		
340	345	350
Gln Gly Thr Gly Glu Lys Thr Leu Gln Leu Met Val Arg Trp Lys Gly		
355	360	365
Tyr Asn Ser Ser Tyr Asp Thr Trp Glu Pro Tyr Ser Gly Leu Gly Asn		
370	375	380
Cys Lys Glu Lys Leu Lys Glu Tyr Val Ile Asp Gly Phe Lys Ser His		
385	390	395 400
Leu Leu Pro Leu Pro Gly Thr Val Tyr Thr Val Cys Gly Gly Pro Pro		
405	410	415
Cys Gln Gly Ile Ser Gly Tyr Asn Arg Tyr Arg Asn Asn Glu Ala Pro		
420	425	430
Leu Glu Asp Gln Lys Asn Gln Gln Leu Leu Val Phe Leu Asp Ile Ile		
435	440	445
Asp Phe Leu Lys Pro Asn Tyr Val Leu Met Glu Asn Val Val Asp Leu		
450	455	460
Leu Arg Phe Ser Lys Gly Phe Leu Ala Arg His Ala Val Ala Ser Phe		

465

470

475

480

Val Ala Met Asn Tyr Gln Thr Arg Leu Gly Met Met Ala Ala Gly Ser
485 490 495

Tyr Gly Leu Pro Gln Leu Arg Asn Arg Val Phe Leu Trp Ala Ala Gln
500 505 510

Pro Ser Glu Lys Leu Pro Pro Tyr Pro Leu Pro Thr His Glu Val Ala
515 520 525

Lys Lys Phe Asn Thr Pro Lys Glu Phe Lys Asp Leu Gln Val Gly Arg
530 535 540

Ile Gln Met Glu Phe Leu Lys Leu Asp Asn Ala Leu Thr Leu Ala Asp
545 550 555 560

Ala Ile Ser Asp Leu Pro Pro Val Thr Asn Tyr Val Ala Asn Asp Val
565 570 575

Met Asp Tyr Asn Asp Ala Ala Pro Lys Thr Glu Phe Glu Asn Phe Ile
580 585 590

Ser Leu Lys Arg Ser Glu Thr Leu Leu Pro Ala Cys Gly Gly Asp Pro
595 600 605

Thr Arg Arg Leu Phe Asp His Gln Pro Leu Val Leu Gly Asp Asp Asp
610 615 620

Leu Glu Arg Val Ser Tyr Ile Pro Lys Gln Lys Gly Ala Asn Tyr Arg
625 630 635 640

Asp Met Pro Gly Val Leu Val His Asn Asn Lys Ala Glu Ile Asn Pro
645 650 655

Arg Phe Arg Ala Lys Leu Lys Ser Gly Lys Asn Val Val Pro Ala Tyr
660 665 670

Ala Ile Ser Phe Ile Lys Gly Lys Ser Lys Lys Pro Phe Gly Arg Leu
675 680 685

Trp Gly Asp Glu Ile Val Asn Thr Val Val Thr Arg Ala Glu Pro His
690 695 700

Asn Gln Cys Val Ile His Pro Met Gln Asn Arg Val Leu Ser Val Arg
705 710 715 720

Glu Asn Ala Arg Leu Gln Gly Phe Pro Asp Cys Tyr Lys Leu Cys Gly

Thr Ile Lys Glu Lys Tyr Ile Gln Val Gly Asn Ala Val Ala Val Pro
740 745 750

Val Gly Val Ala Leu Gly Tyr Ala Phe Gly Met Ala Ser Gln Gly Leu
755 760 765

Thr Asp Asp Glu Pro Val Ile Lys Leu Pro Phe Lys Tyr Pro Glu Cys
770 775 780

Met Gln Ala Lys Asp Gln Ile
785 790

<210> 45

<211> 444

<212> PRT

<213> Zea mays

<400> 45

Leu Asp Ile Phe Ala Gly Cys Gly Gly Leu Ser Glu Gly Leu Gln Gln
1 5 10 15

Ala Gly Val Ser Phe Thr Lys Trp Ala Ile Glu Tyr Glu Glu Pro Ala
20 25 30

Gly Glu Ala Phe Asn Lys Asn His Pro Glu Ala Val Val Phe Val Asp
35 40 45

Asn Cys Asn Val Ile Leu Lys Ala Ile Met Asp Lys Cys Gly Asp Thr
50 55 60

Asp Asp Cys Val Ser Thr Ser Glu Ala Ala Glu Gln Ala Ala Lys Leu
65 70 75 80

Pro Glu Val Asn Ile Asn Asn Leu Pro Val Pro Gly Glu Val Glu Phe
85 90 95

Ile Asn Gly Gly Pro Pro Cys Gln Gly Phe Ser Gly Met Asn Arg Phe
100 105 110

Asn Cys Gln Ser Pro Trp Ser Lys Val Gln Cys Glu Met Ile Leu Ala
115 120 125

Phe Leu Ser Phe Ala Glu Tyr Phe Arg Pro Arg Phe Phe Leu Leu Glu
130 135 140

Asn Val Arg Asn Phe Val Ser Phe Asn Lys Gly Gln Thr Phe Arg Leu			
145	150	155	160
Ala Val Ala Ser Leu Leu Glu Met Gly Tyr Gln Val Arg Phe Gly Ile			
	165	170	175
Leu Glu Ala Gly Ala Phe Gly Val Ala Gln Ser Arg Lys Arg Ala Phe			
	180	185	190
Ile Trp Ala Ala Ala Pro Gly Glu Met Leu Pro Asp Trp Pro Glu Pro			
	195	200	205
Met His Val Phe Ala Ser Pro Glu Leu Lys Ile Thr Leu Pro Asp Gly			
	210	215	220
Gln Tyr Tyr Ala Ala Ala Arg Ser Thr Ala Gly Gly Ala Pro Phe Arg			
	225	230	235
Ala Ile Thr Val Arg Asp Thr Ile Gly Asp Leu Pro Lys Val Gly Asn			
	245	250	255
Gly Ala Ser Lys Leu Thr Leu Glu Tyr Gly Gly Glu Pro Val Ser Trp			
	260	265	270
Phe Gln Lys Lys Ile Arg Gly Ser Met Met Val Leu Asn Asp His Ile			
	275	280	285
Ser Lys Glu Met Asn Glu Leu Asn Leu Ile Arg Cys Gln His Ile Pro			
	290	295	300
Lys Arg Pro Gly Cys Asp Trp His Asp Leu Pro Asp Glu Lys Val Lys			
	305	310	315
Leu Ser Asn Gly Gln Met Ala Asp Leu Ile Pro Trp Cys Leu Pro Asn			
	325	330	335
Thr Ala Lys Arg His Asn Gln Trp Lys Gly Cys Leu Tyr Gly Arg Leu			
	340	345	350
Asp Trp Glu Gly Asn Phe Pro Thr Ser Val Thr Asp Pro Gln Pro Met			
	355	360	365
Gly Lys Val Gly Met Cys Phe His Pro Asp Gln Asp Arg Ile Ile Thr			
	370	375	380
Val Arg Glu Cys Ala Arg Ser Gln Gly Phe Pro Asp Ser Tyr Glu Phe			
	385	390	395
			400

Ala Gly Asn Ile Gln Asn Lys His Arg Gln Ile Gly Asn Ala Val Pro
405 410 415

Pro Pro Leu Ala Tyr Ala Leu Gly Arg Lys Leu Lys Glu Ala Val Asp
420 425 430

Lys Arg Gln Glu Ala Ser Ala Gly Val Pro Ala Pro
435 440

<210> 46
<211> 440
<212> PRT
<213> Arabidopsis thaliana

<400> 46
Leu Asp Ile Phe Ala Gly Cys Gly Gly Leu Ser His Gly Leu Lys Lys
1 5 10 15
Ala Gly Val Ser Asp Ala Lys Trp Ala Ile Glu Tyr Glu Glu Pro Ala
20 25 30
Gly Gln Ala Phe Lys Gln Asn His Pro Glu Ser Thr Val Phe Val Asp
35 40 45
Asn Cys Asn Val Ile Leu Arg Ala Ile Met Glu Lys Gly Gly Asp Gln
50 55 60
Asp Asp Cys Val Ser Thr Thr Glu Ala Asn Glu Leu Ala Ala Lys Leu
65 70 75 80
Thr Glu Glu Gln Lys Ser Thr Leu Pro Leu Pro Gly Gln Val Asp Phe
85 90 95
Ile Asn Gly Gly Pro Pro Cys Gln Gly Phe Ser Gly Met Asn Arg Phe
100 105 110
Asn Cys Gln Ser Ser Trp Ser Lys Val Gln Cys Glu Met Ile Leu Ala
115 120 125
Phe Leu Ser Phe Ala Asp Tyr Phe Arg Pro Arg Tyr Phe Leu Leu Glu
130 135 140
Asn Val Arg Thr Phe Val Ser Phe Asn Lys Gly Gln Thr Phe Gln Leu
145 150 155 160
Thr Leu Ala Ser Leu Leu Glu Met Gly Tyr Gln Val Arg Phe Gly Ile
165 170 175

Leu Glu Ala Gly Ala Tyr Gly Val Ser Gln Ser Arg Lys Arg Ala Phe
 180 185 190
 Ile Trp Ala Ala Ala Pro Glu Glu Val Leu Pro Glu Trp Pro Glu Pro
 195 200 205
 Met His Val Phe Gly Val Pro Lys Leu Lys Ile Ser Leu Ser Gln Gly
 210 215 220
 Leu His Tyr Ala Ala Val Arg Ser Thr Ala Leu Gly Ala Pro Phe Arg
 225 230 235 240
 Pro Ile Thr Val Arg Asp Thr Ile Gly Asp Leu Pro Ser Val Glu Asn
 245 250 255
 Gly Asp Ser Arg Thr Asn Lys Glu Tyr Lys Glu Val Ala Val Ser Trp
 260 265 270
 Phe Gln Lys Glu Ile Arg Gly Asn Thr Ile Ala Leu Thr Asp His Ile
 275 280 285
 Cys Lys Ala Met Asn Glu Leu Asn Leu Ile Arg Cys Lys Leu Ile Pro
 290 295 300
 Thr Arg Pro Gly Ala Asp Trp His Asp Leu Pro Lys Arg Lys Val Thr
 305 310 315 320
 Leu Ser Asp Gly Arg Val Glu Glu Met Ile Pro Phe Cys Leu Pro Asn
 325 330 335
 Thr Ala Glu Arg His Asn Gly Trp Lys Gly Leu Tyr Gly Arg Leu Asp
 340 345 350
 Trp Gln Gly Asn Phe Pro Thr Ser Val Thr Asp Pro Gln Pro Met Gly
 355 360 365
 Lys Val Gly Met Cys Phe His Pro Glu Gln His Arg Ile Leu Thr Val
 370 375 380
 Arg Glu Cys Ala Arg Ser Gln Gly Phe Pro Asp Ser Tyr Glu Phe Ala
 385 390 395 400
 Gly Asn Ile Asn His Lys His Arg Gln Ile Gly Asn Ala Val Pro Pro
 405 410 415
 Pro Leu Ala Phe Ala Leu Gly Arg Lys Leu Lys Glu Ala Leu His Leu
 420 425 430

Lys Lys Ser Pro Gln His Gln Pro
435 440

<210> 47
<211> 130
<212> DNA
<213> Zea mays

<400> 47
catgctgttg ggccatgtgt ctagtgttg cccattaacg tgtacacata tactagaagt 60
gtgtgtggtg tagagagagt gctgtatgtt ttccacattc cagaaaaatc cacatgggtat 120
cagagccagg 130

<210> 48
<211> 123
<212> DNA
<213> Zea mays

<400> 48
cagggggagt gttgggcat gtgtctagtg ttggccatt aacgtgtaca catatactag 60
aagtgtgtgt ggtgtagaga gagtgtgtga tgttttccac attccagaaa aatccacaca 120
tgc 123

<210> 49
<211> 14
<212> PRT
<213> Zea mays

<400> 49
Cys Tyr Asn Cys Gly Asn Val Gly His Ile Ala Arg Asn Cys
1 5 10

<210> 50
<211> 17
<212> PRT
<213> Zea mays

<400> 50
Thr Gln Val Thr Gln Leu Lys Trp Ile Leu Asp Ser Gly Ala Ser Lys
1 5 10 15

His

<210> 51
 <211> 14
 <212> PRT
 <213> Zea mays

<400> 51
 Cys Gln Val Cys Ser Arg Val Gly His Thr Ala Leu Asn Cys
 1 5 10

<210> 52
 <211> 17
 <212> PRT
 <213> Zea mays

<400> 52
 Gln Asn Gly Ser Asn Val Pro Trp Tyr Thr Asp Thr Gly Ala Thr Asp
 1 5 10 15

His

<210> 53
 <211> 14
 <212> PRT
 <213> Oryza sativa

<400> 53
 Cys Gln Val Cys Phe Lys Arg Gly His Thr Ala Ala Asp Cys
 1 5 10

<210> 54
 <211> 17
 <212> PRT
 <213> Oryza sativa

<400> 54
 Ser Tyr Gly Ile Asp Thr Asn Trp Tyr Ile Asp Thr Gly Ala Thr Asp
 1 5 10 15

His

<210> 55
<211> 14
<212> PRT
<213> Arabidopsis thaliana

<400> 55
Cys Ser Asn Cys Gly Arg Thr Gly His Glu Lys Lys Glu Cys
1 5 10

<210> 56
<211> 17
<212> PRT
<213> Arabidopsis thaliana

<400> 56
Gly Lys Thr Lys Leu Gly Asp Ile Ile Leu Asp Ser Gly Ala Ser His
1 5 10 15

His

<210> 57
<211> 14
<212> PRT
<213> Zea mays

<400> 57
Lys His His Cys Gly Arg Glu Gly His Ile Lys Lys Asp Cys
1 5 10

<210> 58
<211> 17
<212> PRT
<213> Drosophila melanogaster

<400> 58
Ser Val Met Asp Asn Cys Gly Phe Val Leu Asp Ser Gly Ala Ser Asp
1 5 10 15

His

<210> 59
<211> 52

<212> PRT

<213> Zea mays

<400> 59

Gln Val Lys Ile Leu Arg Pro Asp Asn Gly Thr Glu Tyr Val Asn Lys
1 5 10 15

Gly Phe Asn Ala Phe Leu Ser Arg Asn Gly Ile Leu His Gln Thr Ser
20 25 30

Cys Pro Asp Thr Pro Pro Gln Asn Gly Val Ala Glu Arg Lys Asn Arg
35 40 45

His Ile Leu Glu
50

<210> 60

<211> 50

<212> PRT

<213> Zea mays

<400> 60

Lys Ile Ile Ala Phe Gln Ser Asp Trp Gly Gly Glu Tyr Glu Lys Leu
1 5 10 15

Asn Ala His Phe Lys Thr Ile Gly Ile His His Gln Val Ser Cys Pro
20 25 30

His Thr His Gln Gln Asn Gly Ala Ala Glu Arg Lys His Arg His Ile
35 40 45

Val Glu
50

<210> 61

<211> 51

<212> PRT

<213> Oryza sativa

<400> 61

Lys Ile Ile Ala Met Gln Thr Asp Trp Arg Gly Gly Arg Tyr Gln Lys
1 5 10 15

Leu Asn Ser Phe Phe Ala Gln Ile Gly Leu Ile Ile Met Cys His Val
20 25 30

Leu Thr Leu Ile Arg Gln Asn Gly Ser Ala Glu Arg Lys His Arg His
 35 40 45

Ile Val Glu
 50

<210> 62
 <211> 50.
 <212> PRT
 <213> Arabidopsis thaliana

<400> 62
 Thr Val Lys Met Val Arg Ser Asp Asn Gly Thr Glu Phe Met Cys Leu
 1 5 10 15

Ser Ser Tyr Phe Arg Glu Asn Gly Ile Ile His Gln Thr Ser Cys Val
 20 25 30

Gly Thr Pro Gln Gln Asn Gly Arg Val Glu Arg Lys His Arg His Ile
 35 40 45

Leu Asn
 50

<210> 63
 <211> 52
 <212> PRT
 <213> Drosophila melanogaster

Lys Val Val Tyr Leu Tyr Ile Asp Asn Gly Arg Glu Tyr Leu Ser Asn
 1 5 10 15

Glu Met Arg Gln Phe Cys Val Lys Lys Gly Ile Ser Tyr His Leu Thr
 20 25 30

Val Pro His Thr Pro Gln Leu Asn Gly Val Ser Glu Arg Met Ile Arg
 35 40 45

Thr Ile Thr Glu
 50

<210> 64
 <211> 71
 <212> PRT

<210> 67
 <211> 12
 <212> PRT
 <213> Zea mays

<400> 67
 Ile Tyr Ile Leu Val Tyr Val Asp Asp Ile Ile Ile
 1 5 10

<210> 68
 <211> 71
 <212> PRT
 <213> Oryza sativa

<400> 68
 Arg Tyr Lys Ala Arg Leu Val Ala Lys Gly Phe Lys Gln Arg Tyr Gly
 1 5 10 15
 Ile Asp Tyr Glu Asp Thr Phe Ser Pro Val Val Lys Ala Ala Thr Ile
 20 25 30
 Arg Ile Ile Leu Ser Ile Ala Val Ser Arg Gly Trp Ser Leu Arg Gln
 35 40 45
 Leu Asp Val Gln Asn Ala Phe Leu His Gly Phe Leu Glu Glu Glu Val
 50 55 60
 Tyr Met Gln Gln Pro Pro Gly
 65 70

<210> 69
 <211> 12
 <212> PRT
 <213> Oryza sativa

<400> 69
 Met Phe Val Leu Val Tyr Val Asp Asp Ile Ile Val
 1 5 10

<210> 70
 <211> 71
 <212> PRT

<213> Arabidopsis thaliana

<400> 70

Arg Tyr Lys Ala Arg Leu Val Val Gln Gly Asn Lys Gln Val Glu Gly
1 5 10 15

Glu Asp Tyr Lys Glu Thr Phe Ala Pro Val Val Arg Met Thr Thr Val
20 25 30

Arg Thr Leu Leu Arg Asn Val Ala Ala Asn Gln Trp Glu Val Tyr Gln
35 40 45

Met Asp Val His Asn Ala Phe Leu His Gly Asp Leu Glu Glu Glu Val
50 55 60

Tyr Met Lys Leu Pro Pro Gly
65 70

<210> 71

<211> 12

<212> PRT

<213> Arabidopsis thaliana

<400> 71

Leu Arg Val Leu Ile Tyr Val Asp Asp Leu Leu Ile
1 5 10

<210> 72

<211> 71

<212> PRT

<213> Drosophila melanogaster

<400> 72

Arg Tyr Lys Ala Arg Leu Val Ala Arg Gly Phe Thr Gln Lys Tyr Gln
1 5 10 15

Ile Asp Tyr Glu Glu Thr Phe Ala Pro Val Ala Arg Ile Ser Ser Phe
20 25 30

Arg Phe Ile Leu Ser Leu Val Ile Gln Tyr Asn Leu Lys Val His Gln
35 40 45

Met Asp Val Lys Thr Ala Phe Leu Asn Gly Thr Leu Lys Glu Glu Ile
50 55 60

Tyr Met Arg Leu Pro Gln Gly

<210> 73

<211> 12

<212> PRT

<213> *Drosophila melanogaster*

<400> 73

Ile Tyr Val Leu Leu Tyr Val Asp Asp Val Val Ile

1

5

10

<210> 74

<211> 62

<212> PRT

<213> *Zea mays*

<400> 74

Asp Ala Asp Trp Gly Ser Cys Leu Asp Asp Arg Arg Ser Thr Ser Gly

1

5

10

15

Tyr Cys Val Phe Val Gly Gly Asn Leu Val Ser Trp Arg Ser Lys Lys

20

25

30

Gln Ser Val Val Ser Arg Ser Thr Ala Glu Ala Glu Tyr Arg Ala Met

35

40

45

Ala Leu Ala Ile Cys Glu Met Leu Trp Ile Lys Gly Leu Leu

50

55

60

<210> 75

<211> 17

<212> PRT

<213> *Zea mays*

<400> 75

Asn Pro Val Gln His Asp Arg Thr Lys His Val Glu Ile Asp Arg Phe

1

5

10

15

Phe

<210> 76

<211> 62

<212> PRT

<213> Zea mays

<400> 76

Asp Ala Asp Trp Ala Gly Cys Pro Asp Asp Arg Lys Ser Thr Gly Gly
1 5 10 15

Tyr Ala Leu Phe Leu Gly Pro Asn Leu Ile Ser Trp Asn Ser Lys Lys
20 25 30

Gln Ser Thr Val Ser Arg Ser Ser Thr Glu Ala Glu Tyr Lys Ala Met
35 40 45

Ala Asn Ala Thr Ala Glu Val Ile Trp Leu Gln Ser Leu Leu
50 55 60

<210> 77

<211> 17

<212> PRT

<213> Zea mays

<400> 77

Lys Pro Ile Phe Asn Ala Arg Thr Lys His Ile Glu Val Asp Phe His
1 5 10 15

Phe

<210> 78

<211> 62

<212> PRT

<213> Oryza sativa

<400> 78

Asp Ala Asp Trp Ala Gly Ser Ile Asp Asp Arg Lys Ser Thr Gly Gly
1 5 10 15

Phe Ala Val Phe Leu Gly Ser Asn Leu Val Ser Trp Ser Ala Arg Lys
20 25 30

Gln Pro Thr Val Ser Arg Ser Ser Thr Glu Ala Glu Tyr Lys Ala Val
35 40 45

Ala Asn Thr Thr Ala Glu Leu Ile Trp Val Gln Thr Leu Leu
50 55 60

<210> 79
<211> 17
<212> PRT
<213> Oryza sativa

<400> 79
Asn Pro Val Phe His Ala Arg Thr Lys His Ile Glu Val Asp Tyr His
1 5 10 15

Phe

<210> 80
<211> 62
<212> PRT
<213> Arabidopsis thaliana

<400> 80
Asp Ser Asp Trp Gln Ser Cys Pro Leu Thr Arg Arg Ser Ile Ser Ala
1 5 10 15
Tyr Val Val Leu Leu Gly Gly Ser Pro Ile Ser Trp Lys Thr Lys Lys
20 25 30
Gln Asp Thr Val Ser His Ser Ser Ala Glu Ala Glu Tyr Arg Ala Met
35 40 45
Ser Tyr Ala Leu Lys Glu Ile Lys Trp Leu Arg Lys Leu Leu
50 55 60

<210> 81
<211> 17
<212> PRT
<213> Arabidopsis thaliana

<400> 81
Asn Pro Val Phe His Glu Arg Thr Lys His Ile Glu Ser Asp Cys His
1 5 10 15

Ser

<210> 82
<211> 63
<212> PRT

<213> Drosophila melanogaster

<400> 82

Asp Ser Asp Trp Ala Gly Ser Glu Ile Asp Arg Lys Ser Thr Thr Gly
1 5 10 15

Tyr Leu Phe Lys Met Phe Asp Phe Asn Leu Ile Cys Trp Asn Thr Lys
20 25 30

Arg Gln Asn Ser Val Ala Ala Ser Ser Thr Glu Ala Glu Tyr Met Ala
35 40 45

Leu Phe Glu Ala Cys Arg Glu Ala Leu Trp Leu Lys Phe Leu Leu
50 55 60

<210> 83

<211> 17

<212> PRT

<213> Drosophila melanogaster

<400> 83

Asn Pro Ser Cys His Lys Arg Ala Lys His Ile Asp Ile Lys Tyr His
1 5 10 15

Phe

<210> 84

<211> 1181

<212> DNA

<213> Zea mays

<400> 84

gggaattcga ttactcacta tagcgctcga gcggccgccc gggcagggtc gaaaaccatc 60
aacctaacga tgtaatggag tatggtgggt cccccaagac agagttccag cgctacattc 120
gacttggtcg taaagacatg ttggattggt cgtttggtga ggagggtggt ccagatgaag 180
gcaagctctt ggaatcaccag cccttacggc ttaacaatga tgattatgag cgggttaagc 240
aaattcctgt caagaaggga gccaaactcc gtgacctaaa ggggtgtcaag gttggagcaa 300
ataatgttgt tgagtgggat ccagaagtcg aacgtgtgta cctttcgtct gggaaaccac 360
tggttcctga ctatgcgatg tcattcatca agggcaaatc actcaagcca ttccggcgcc 420
tgtgttgga ccaagcgggt cctacagttg tgaccagagc agagcctcat aaccaggtta 480
tattgatcc gactcaagca agagtcttga ctatccggga gaacgcaagg ttacagggct 540
tcccgaatta ctaccgattg ttggaccga tcaaggagaa gtatattcaa gtcgggaacg 600
cagtggcagt ccctgttgca cgggcactgg gctactgtct gggtaagcc tacctgggtg 660
aatctgacgg gagtgcagct ctgtaccagc tgcctgaag ttttacctct gtcgggcgaa 720
ccgcgggtta ggcgaatgcc gcttctgttg gcactcctgc gggggaggta gtcgagcagt 780

aaaaggatag cggagcaacc ctggttggtt ttttgattcg agcccatcca gtagcatgtt 840
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 ctgactcgag ctcgagtgc tttgtactg taggttgagg tttctcatcc attggcctgc 960
 ctattttggtg atgacgtttc atttcagatt agcaatgtgc ttatttaagg ttctgtcatg 1020
 tacctgtatt ctacaatcca ctattgtttc caaagacagc atttgatcct taaaaaaaaa 1080
 tgtaaaaaaa aaaaaacagt gcccgaaaag ccgcaaaaaa aaaaaaaaaa aaacctgcc 1140
 cgggcggccg ctcgagccct atagtgagta atcgattcc c 1181

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<211> 6

<212> PRT

<213> Zea mays

<400> 85

Glu Phe Asp Tyr Ser Leu

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<210> 86

<211> 252

<212> PRT

<213> Zea mays

<400> 86

Arg Ser Ser Gly Arg Pro Gly Arg Phe Glu Asn His Gln Pro Asn Asp

1

5

10

15

Lys Met Glu Tyr Gly Gly Ser Pro Lys Thr Glu Phe Gln Arg Tyr Ile

20

25

30

Arg Leu Gly Arg Lys Asp Met Leu Asp Trp Ser Phe Gly Glu Glu Ala

35

40

45

Gly Pro Asp Glu Gly Lys Leu Leu Asp His Gln Pro Leu Arg Leu Asn

50

55

60

Asn Asp Asp Tyr Glu Arg Val Lys Gln Ile Pro Val Lys Lys Gly Ala

65

70

75

80

Asn Phe Arg Asp Leu Lys Gly Val Lys Val Gly Ala Asn Asn Val Val

85

90

95

Glu Trp Asp Pro Glu Val Glu Arg Val Tyr Leu Ser Ser Gly Lys Pro

100

105

110

Leu Val Pro Asp Tyr Ala Met Ser Phe Ile Lys Gly Lys Ser Leu Lys

115

120

125

Pro Phe Gly Arg Leu Trp Trp Asp Gln Thr Val Pro Thr Val Val Thr
130 135 140

Arg Ala Glu Pro His Asn Gln Val Ile Leu His Pro Thr Gln Ala Arg
145 150 155 160

Val Leu Thr Ile Arg Glu Asn Ala Arg Leu Gln Gly Phe Pro Asp Tyr
165 170 175

Tyr Arg Leu Phe Gly Pro Ile Lys Glu Lys Tyr Ile Gln Val Gly Asn
180 185 190

Ala Val Ala Val Pro Val Ala Arg Ala Leu Gly Tyr Cys Leu Gly Gln
195 200 205

Ala Tyr Leu Gly Glu Ser Asp Gly Ser Gln Pro Leu Tyr Gln Leu Pro
210 215 220

Ala Ser Phe Thr Ser Val Gly Arg Thr Ala Val Gln Ala Asn Ala Ala
225 230 235 240

Ser Val Gly Thr Pro Ala Gly Glu Val Val Glu Gln
245 250

<210> 87

<211> 246

<212> PRT

<213> Zea mays

<400> 87

Lys Val Gln Asn His Gln Pro Asn Asp Val Met Glu Tyr Gly Gly Ser
1 5 10 15

Pro Lys Thr Glu Phe Gln Arg Tyr Ile Arg Leu Ser Arg Lys Asp Met
20 25 30

Leu Asp Trp Ser Phe Gly Glu Gly Ala Gly Pro Asp Glu Gly Lys Leu
35 40 45

Leu Asp His Gln Pro Leu Arg Leu Asn Asn Asp Asp Tyr Glu Arg Val
50 55 60

Gln Gln Ile Pro Val Lys Lys Gly Ala Asn Phe Arg Asp Leu Lys Gly
65 70 75 80

Val Arg Val Gly Ala Asn Asn Ile Val Glu Trp Asp Pro Glu Ile Glu

Arg Val Lys Leu Ser Ser Gly Lys Pro Leu Val Pro Asp Tyr Ala Met
100 105 110

Ser Phe Ile Lys Gly Lys Ser Leu Lys Pro Phe Gly Arg Leu Trp Trp
115 120 125

Asp Glu Thr Val Pro Thr Val Val Thr Arg Ala Glu Pro His Asn Gln
130 135 140

Val Ile Ile His Pro Thr Gln Ala Arg Val Leu Thr Ile Arg Glu Asn
145 150 155 160

Ala Arg Leu Gln Gly Phe Pro Asp Tyr Tyr Arg Leu Phe Gly Pro Ile
165 170 175

Lys Glu Lys Tyr Ile Gln Val Gly Asn Ala Val Ala Val Pro Val Ala
180 185 190

Arg Ala Leu Gly Tyr Cys Leu Gly Gln Ala Tyr Leu Gly Glu Ser Glu
195 200 205

Gly Ser Asp Pro Leu Tyr Gln Leu Pro Pro Ser Phe Thr Ser Val Gly
210 215 220

Gly Arg Thr Ala Gly Gln Ala Arg Ala Ser Pro Val Gly Thr Pro Ala
225 230 235 240

Gly Glu Val Val Glu Gln
245

<210> 88

<211> 226

<212> PRT

<213> Zea mays

<400> 88

Asn His Gln Pro Asn Asp Val Met Glu Tyr Gly Gly Ser Pro Lys Thr
1 5 10 15

Glu Phe Gln Arg Tyr Ile Arg Leu Arg Lys Asp Met Leu Asp Trp Ser
20 25 30

Phe Gly Glu Ala Gly Pro Asp Glu Gly Lys Leu Leu Asp His Gln Pro
35 40 45

Leu Arg Leu Asn Asn Asp Asp Tyr Glu Arg Val Gln Ile Pro Val Lys
50 55 60

Lys Gly Ala Asn Phe Arg Asp Leu Lys Gly Val Val Gly Ala Asn Asn
65 70 75 80

Val Glu Trp Asp Pro Glu Glu Arg Val Leu Ser Ser Gly Lys Pro Leu
85 90 95

Val Pro Asp Tyr Ala Met Ser Phe Ile Lys Gly Lys Ser Leu Lys Pro
100 105 110

Phe Gly Arg Leu Trp Trp Asp Thr Val Pro Thr Val Val Thr Arg Ala
115 120 125

Glu Pro His Asn Gln Val Ile His Pro Thr Gln Ala Arg Val Leu Thr
130 135 140

Gly Arg Glu Asn Ala Arg Leu Gln Gly Phe Pro Asp Tyr Tyr Arg Leu
145 150 155 160

Phe Gly Pro Ile Lys Glu Lys Tyr Ile Gln Val Gly Asn Ala Val Ala
165 170 175

Val Pro Val Ala Arg Ala Leu Gly Tyr Cys Leu Gly Gln Ala Tyr Leu
180 185 190

Gly Glu Ser Gly Ser Pro Leu Tyr Gln Leu Pro Ser Phe Thr Ser Val
195 200 205

Gly Arg Thr Ala Gln Ala Ala Val Gly Thr Pro Ala Gly Glu Val Val
210 215 220

Glu Gln
225

<210> 89

<211> 245

<212> PRT

<213> Zea mays

<400> 89

Arg Phe Glu Asn His Gln Pro Asn Asp Val Met Glu Tyr Gly Gly Ser
1 5 10 15

Pro Lys Thr Glu Phe Gln Arg Tyr Ile Arg Leu Gly Arg Lys Asp Met
20 25 30

Leu Asp Trp Ser Phe Gly Glu Glu Ala Gly Pro Asp Glu Gly Lys Leu
35 40 45

Leu Asp His Gln Pro Leu Arg Leu Asn Asn Asp Asp Tyr Glu Arg Val
50 55 60

Lys Gln Ile Pro Val Lys Lys Gly Ala Asn Phe Arg Asp Leu Lys Gly
65 70 75 80

Val Lys Val Gly Ala Asn Asn Val Val Glu Trp Asp Pro Glu Val Glu
85 90 95

Arg Val Tyr Leu Ser Ser Gly Lys Pro Leu Val Pro Asp Tyr Ala Met
100 105 110

Ser Phe Ile Lys Lys Ser Leu Lys Pro Phe Gly Arg Leu Trp Trp
115 120 125

Asp Gln Thr Val Pro Thr Val Val Thr Arg Ala Glu Tyr Pro His Asn Gln
130 135 140

Val Ile Leu His Pro Thr Gln Ala Arg Val Leu Thr Ile Arg Glu Asn
145 150 155 160

Ala Arg Leu Gln Gly Phe Pro Asp Tyr Tyr Arg Leu Phe Gly Pro Ile
165 170 175

Lys Glu Lys Tyr Ile Gln Val Gly Asn Ala Val Ala Val Pro Val Ala
180 185 190

Arg Ala Leu Gly Tyr Cys Leu Gly Gln Ala Tyr Leu Gly Glu Ser Asp
195 200 205

Gly Ser Gln Pro Leu Tyr Gln Leu Pro Ala Ser Phe Thr Ser Val Gly
210 215 220

Arg Thr Ala Val Gln Ala Asn Ala Ala Ser Val Gly Thr Pro Ala Gly
225 230 235 240

Glu Val Val Glu Gln
245

<210> 90

<211> 12812

<212> DNA

<213> Zea mays

<400> 90

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aattccaaaa	taattacac	aacaaagact	aaattgtaag	caaacctttc	aagtctaat	180
aattcataat	tacaaatgtt	attgtaacat	catgttaccc	aatcataaac	taaccagggt	240
cccatgtgta	attagtttta	taattatatt	atatttaata	tttgtaacta	attgatgtga	300
cagtactaaa	attaagcctc	ttaagccaaa	aaatccacat	attttagatt	taaaatttga	360
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cccatactac	ttccatcacc	agtcacagta	tccaccaccc	caccctacag	ctgggtcatc	480
tggcaccggg	ggagggggcca	acggccaaaa	gcggccggca	cttcggcgcg	gcacccctcg	540
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